Amendments to the Claims

This listing of claims replaces and supercedes any prior claim listing:

1. (Currently Amended) A method for determining a bound around a reference time <u>such that the reference time is determined to have occurred between a first bound limit and a second bound limit</u>, the method comprising the steps of:

transmitting a ~~nonce~~ <u>protected reference time request</u> to a higher level computing device, wherein the higher level computing device is a level closer to a reference time ~~computing device~~ <u>source</u>;

receiving a response from the higher level computing device, the response comprising~~:~~ a ~~signed~~ <u>protected</u> reference time ~~computing device~~ <u>source</u> response, the reference time ~~computing device~~ <u>source</u> response comprising ~~a~~ <u>the</u> reference time~~,~~; <u>and</u> a ~~hashed~~ collection <u>of protected reference time requests</u> from each first level computing device that had transmitted the ~~hashed~~ collection <u>of protected reference time requests</u> to the reference time ~~computing device~~ <u>source</u> prior to the reference time~~; and a sibling nonce from each initiating computing device that had transmitted the sibling nonce to the higher level computing device before the higher level computing device hashed the nonce and the sibling nonce for transmission to a subsequently higher level computing device~~;

setting ~~a~~ <u>the</u> first bound limit at a transmittal time~~, wherein the transmittal time is~~ when the ~~nonce~~<u>protected reference time request</u> was transmitted to the higher level computing device; and

setting ~~a~~ <u>the</u> second bound limit at a receipt time~~, wherein the receipt time is~~ when the response from the higher level computing device was received.

2. (Currently Amended) A computer-readable medium having computer-executable instructions for determining a bound around a reference time <u>such that the reference time is determined to have occurred between a first bound limit and a second bound limit</u>, the computer-executable instructions performing steps comprising:

transmitting a ~~nonce~~ protected reference time request to a higher level computing device, wherein the higher level computing device is a level closer to a reference time ~~computing device~~ source;

receiving a response from the higher level computing device, the response comprising~~:~~ a ~~signed~~ protected reference time ~~computing device~~ source response, the reference time ~~computing device~~ source response comprising ~~a~~ the reference time~~,~~; and a ~~hashed~~ collection of protected reference time requests from each first level computing device that had transmitted the ~~hashed~~ collection of protected reference time requests to the reference time ~~computing device~~ source prior to the reference time~~; and a sibling nonce from each initiating computing device that had transmitted the sibling nonce to the higher level computing device before the higher level computing device hashed the nonce and the sibling nonce for transmission to a subsequently higher level computing device~~;

setting ~~a~~ the first bound limit at a transmittal time~~, wherein the transmittal time is~~ when the ~~nonce~~ protected reference time request was transmitted to the higher level computing device; and

setting ~~a~~ the second bound limit at a receipt time~~, wherein the receipt time is~~ when the response from the higher level computing device was received.

3.   Canceled

4. (New) The method of claim 1, wherein the reference time source is a distributed computing system implementing a Byzantine fault-tolerant consensus algorithm.

5. (New) The method of claim 1, wherein the protected reference time request and the protected reference time source response are protected through the use of encryption.

6. (New) The method of claim 1, wherein the protected reference time request and the protected reference time source response are protected through the use of a nonce.

7. (New) The method of claim 1 further comprising the steps of: receiving a second protected reference time request from a lower level computing device, wherein the lower level computing device is a level further from the reference time source; and incorporating the second protected reference time request into the protected reference time request prior to transmitting the protected reference time request to the higher level computing device.

8. (New) The method of claim 7, wherein the transmitting the protected reference time request is postponed until a predetermined number of protected reference time requests are received from lower level computing devices.

9. (New) The method of claim 7, wherein the transmitting the protected reference time request occurred at pre-scheduled times, wherein at least one lower level computing device was informed of the pre-scheduled times if any lower level computing devices are present.

10. (New) The method of claim 1, wherein the transmitting the protected reference time request to the higher level computing device comprises transmitting the protected reference time request to at least two higher level computing devices; and wherein further the setting the second bound limit at the receipt time comprises setting the second bound limit at a first receipt time when a first response from the at least two higher level computing devices was received.

11. (New) The method of claim 1 further comprising the steps of: determining a rate of change of a system time with respect to the reference time; and setting the first bound limit and the second bound limit to account for the determined rate of change.

12. (New) The computer-readable medium of claim 2, wherein the reference time source is a distributed computing system implementing a Byzantine fault-tolerant consensus algorithm.

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13. (New) The computer-readable medium of claim 2, wherein the protected reference time request and the protected reference time source response are protected through the use of encryption.

14. (New) The computer-readable medium of claim 2, wherein the protected reference time request and the protected reference time source response are protected through the use of a nonce.

15. (New) The computer-readable medium of claim 2, wherein the response from the higher level computing device is structured in accordance with a Merkle tree algorithm.

16. (New) The computer-readable medium of claim 2 having further computer-executable instructions performing steps comprising: receiving a second protected reference time request from a lower level computing device, wherein the lower level computing device is a level further from the reference time source; and incorporating the second protected reference time request into the protected reference time request prior to transmitting the protected reference time request to the higher level computing device.

17. (New) The computer-readable medium of claim 16, wherein the transmitting the protected reference time request is postponed until a predetermined number of protected reference time requests are received from lower level computing devices.

18. (New) The computer-readable medium of claim 16, wherein the transmitting the protected reference time request occurred at pre-scheduled times, wherein at least one lower level computing device was informed of the pre-scheduled times if any lower level computing devices are present.

19. (New) The computer-readable medium of claim 2, wherein the computer-executable instructions performing the transmitting the protected reference time request to the higher level computing device comprise computer-executable instructions for transmitting the protected reference time request to at least two higher level computing devices; and wherein further the computer-executable instructions performing the setting the second bound limit at the receipt time comprise computer-executable instructions for setting the second bound limit at a first receipt time when a first response from the at least two higher level computing devices was received.

20. (New) The computer-readable medium of claim 2 having further computer-executable instructions performing steps comprising: determining a rate of change of a system time with respect to the reference time; and setting the first bound limit and the second bound limit to account for the determined rate of change.

21. (New) A timing component providing a reference time, the timing component comprising:

a first bound limit indicating an earliest time at which the reference time is determined to have possibly occurred, wherein the first bound limit is based on a transmittal time at which a protected reference time request was transmitted to a higher level computing device, the higher level computing device being a level closer to a reference time source; and

a second bound limit indicating a latest time at which the reference time is determined to have possibility occurred, wherein the second bound limit is based on a receipt time at which a response was received from the higher level computing device, the response comprising the reference time and a protected indication linking the response to the protected reference time request.